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... Philips, and Speechworks who have **targeted** any on ... Even when we exploit **speech** output, it will often ... modality" to denote different user **interface** mechanisms, how ...

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... of which item is currently **targeted** is subtle ... Satisfaction with the **interface** rose when the clock faces ... combined with audible feedback and **speech** synthesis can ...

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... research beyond individual art and technology is also **targeted**. ... and Language CAE, Man-Machine **Interface**, Language Translation, **Speech** and Language ...

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... Lobby7 launched an integrated **speech**/graphics **interface** engine that is **targeted** at companies ... The company's "multi-modal" **interface** engine enables ...

www.reed-electronics.com/commvergemag/article/CA145834?pubdate=4%2F11%2F2001&industryid=2998 - 44k - [Cached](#) - [Similar pages](#)

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... **Speech** can be only a few words, while books can ... Attack Last - Attacks the creature or player your last **targeted**. ... to set how fast or slow the **interface** fades in ...

www.silverblades.net/Shard/options.htm - 30k - [Cached](#) - [Similar pages](#)

[EE Times -Java powers an automotive system design](#)

... It does so through simple and highly **targeted** user **interfaces** driven ... make use of the Java **Speech** Application Programming **Interface**, which provides ...

www.eetimes.com/design_library/ad/c/showArticle.jhtml?articleId=12801860&kc=6410 - 56k - [Cached](#) - [Similar pages](#)

[Shaping the evolution of the PC | CNET News.com](#)

... to see more applications for **speech interfaces** in the ... **Speech** recognition will probably never be perfect, as in ... This is initially a **targeted**, special application ...

marketwatch-cnet.com.com/Shaping+the+evolution+of+the+PC/2009-1082_3-270234.html - 33k - [Cached](#) - [Similar pages](#)

[\[PDF\] Creating conversational interfaces for children - Speech and Audio ...](#)

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... their Jupiter spoken dialog system **targeted** primarily for ... of the player and the game **screen** including the ... very high ratings to the **speech interface** (93% rated ...

sail.usc.edu/publications/IEEESAP_NaPo_2002.pdf - [Similar pages](#)

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... several independent input ser- vices **targeted** for military ... Command **Speech**, Passive **Speech**, Iconic Gesture ... implement a simple server **interface** (labeled "Multi ...

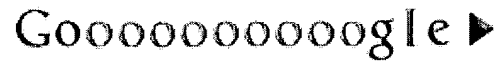
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... Perseus system, a gesture based **interface** for a ... gestures and coordinate with **speech** recognition ... The Interactive Advertising application is **targeted** at allowing ...

www.cs.ucsb.edu/conferences/PUI/PUIWorkshop98/Papers/Lyons.pdf - [Similar pages](#)



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1 [Inferring intent in eye-based interfaces: tracing eye movements with process models](#)

Dario D. Salvucci

 May 1999 **Proceedings of the SIGCHI conference on Human factors in computing systems: the CHI is the limit**

Full text available: pdf(1.05 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: cognitive models, eye movements, eye-based interfaces, hidden Markov models, tracing, user models

2 [A multimodal learning interface for grounding spoken language in sensory perceptions](#)

Chen Yu, Dana H. Ballard

 July 2004 **ACM Transactions on Applied Perception (TAP)**, Volume 1 Issue 1

Full text available: pdf(1.73 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a multimodal interface that learns words from natural interactions with users. In light of studies of human language development, the learning system is trained in an unsupervised mode in which users perform everyday tasks while providing natural language descriptions of their behaviors. The system collects acoustic signals in concert with user-centric multisensory information from nonspeech modalities, such as user's perspective video, gaze positions, head directions, and hand movements ...

Keywords: Multimodal learning, cognitive modeling, multimodal interaction

3 [Overcoming the Lack of Screen Space on Mobile Computers](#)

Stephen Brewster

 January 2002 **Personal and Ubiquitous Computing**, Volume 6 Issue 3

Full text available: pdf(489.31 KB)

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)


One difficulty for interface design on mobile computers is lack of screen space caused by their small size. This paper describes a small pilot study and two formal experiments that investigate the usability of sonically-enhanced buttons of different sizes. The underlying hypothesis being that presenting information about the buttons in sound would increase their usability and allow their size to be reduced. An experimental interface was created that ran on a 3Com Palm III mobile computer and use ...

4 [Two-handed virtual manipulation](#)

Ken Hinckley, Randy Pausch, Dennis Proffitt, Neal F. Kassell

 September 1998 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 5

Issue 3

Full text available:  pdf(1.32 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We discuss a two-handed user interface designed to support three-dimensional neurosurgical visualization. By itself, this system is a "point design," an example of an advanced user interface technique. In this work, we argue that in order to understand why interaction techniques do or do not work, and to suggest possibilities for new techniques, it is important to move beyond point design and to introduce careful scientific measurement of human behavioral principles. In particular ...

Keywords: bimanual asymmetry, haptic input, input devices, three-dimensional interaction, two-handed interaction, virtual manipulation

5 Cooperative bimanual action

Ken Hinckley, Randy Pausch, Dennis Proffitt, James Patten, Neal Kassell



March 1997 **Proceedings of the SIGCHI conference on Human factors in computing systems**

Full text available:  pdf(930.87 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: 3D interaction, bimanual asymmetry, haptics, motor control, two-handed interaction, virtual manipulation

6 Research alerts


January 2001 **interactions**, Volume 8 Issue 1

Full text available:  pdf(885.82 KB)  html(27.23 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

7 An interactive model-based environment for eye-movement protocol analysis and visualization

Dario D. Salvucci

November 2000 **Proceedings of the symposium on Eye tracking research & applications**

Full text available:  pdf(676.72 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes EyeTracer, an interactive environment for manipulating, viewing, and analyzing eye-movement protocols. EyeTracer augments the typical functionality of such systems by incorporating model-based tracing algorithms that interpret protocols with respect to the predictions of a cognitive process model. These algorithms provide robust strategy classification and fixation assignment that help to alleviate common difficulties with eye-movement data, such as equipment noise and in ...

Keywords: eye movements, protocol analysis, tracing, visualization

8 "Composability": widening participation in music making for people with disabilities via music software and controller solutions

Tim Anderson, Clare Smith

April 1996 **Proceedings of the second annual ACM conference on Assistive technologies**

Full text available:  pdf(995.03 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: MIDI, adaptive technology, composition, education, music, physical disability,

visual impairment

- 9 Toward achieving universal usability for older adults through multimodal feedback
V. Kathlene Emery, Paula J. Edwards, Julie A. Jacko, Kevin P. Moloney, Leon Barnard, Thitima Kongnakorn, François Sainfort, Ingrid U. Scott

June 2002 **ACM SIGCAPH Computers and the Physically Handicapped , Proceedings of the 2003 conference on Universal usability**, Issue 73-74

Full text available:  pdf(279.62 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


This experiment examines the effect of combinations of feedback (auditory, haptic, and/or visual) on the performance of older adults completing a drag-and-drop computer task. Participants completed a series of drag-and-drop tasks under each of seven feedback conditions (3 unimodal, 3 bimodal, 1 trimodal). Performance was assessed using measures of efficiency and accuracy. For analyses of results, participants were grouped based on their level of computer experience. All users performed well unde ...

Keywords: auditory, computer use, experience, haptic, multimodal, older adults, visual

- 10 Evaluating the usability of an evolving collaborative product —changes in user type, tasks and evaluation methods over time

Chris Nodder, Gayna Williams, Deborah Dubrow

November 1999 **Proceedings of the international ACM SIGGROUP conference on Supporting group work**

Full text available:  pdf(3.15 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


The first users of a new technology are often engineers and enthusiasts. The functionality and interface that they find acceptable may be very different than the requirements of a more mainstream audience. This poses challenges for usability engineers in both defining user groups and then evaluating a product against usability goals, when both users and goals are changing as the technology matures. Usability evaluation methods for collaborative applications must evolve and iterate at least ...

Keywords: NetMeeting, application sharing, collaborative tools, design consideration, development process, usability evaluation

- 11 An integrated mobility and traffic model for resource allocation in wireless networks

Hisashi Kobayashi, Shun-Zheng Yu, Brian L. Mark

August 2000 **Proceedings of the 3rd ACM international workshop on Wireless mobile multimedia**

Full text available:  pdf(943.60 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In a wireless communications network, the movement of mobile users presents significant technical challenges to providing efficient access to the wired broadband network. In this paper, we construct a new analytical/numerical model that characterizes mobile user behavior and the resultant traffic patterns. The model is based on a semi-Markov process representation of mobile user behavior in a general state-space. Using a new algorithm for parameter estimation of a general Hidden Semi-Markov ...

Keywords: admission control, mobility, resource allocation, traffic modeling, wireless networks

- 12 The reading assistant: eye gaze triggered auditory prompting for reading remediation

John L. Sibert, Mehmet Gokturk, Robert A. Lavine

November 2000 **Proceedings of the 13th annual ACM symposium on User interface software and technology**


Full text available:  pdf(136.92 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: eye gaze, eye tracking, interaction techniques, reading disability

13 [Identifying fixations and saccades in eye-tracking protocols](#)

Dario D. Salvucci, Joseph H. Goldberg

November 2000 **Proceedings of the symposium on Eye tracking research & applications**

Full text available:  pdf(801.16 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The process of fixation identification—separating and labeling fixations and saccades in eye-tracking protocols—is an essential part of eye-movement data analysis and can have a dramatic impact on higher-level analyses. However, algorithms for performing fixation identification are often described informally and rarely compared in a meaningful way. In this paper we propose a taxonomy of fixation identification algorithms that classifies algorithms in terms of how they utilize spat ...

Keywords: data analysis algorithms, eye tracking, fixation identification

14 [Structured hypertext with domain semantics](#)

Weigang Wang, Roy Rada

October 1998 **ACM Transactions on Information Systems (TOIS)**, Volume 16 Issue 4

Full text available:  pdf(593.99 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


One important facet of current hypertext research involves using knowledge-based techniques to develop and maintain document structures. A semantic net is one such technique. However, most semantic-net-based hypertext systems leave the linking consistency of the net to individual users. Users without guidance may accidentally introduce structural and relational inconsistencies in the semantic nets. The relational inconsistency hinders the creation of domain information models. The structura ...

Keywords: graph theory, hypertext models, hypertext structures

15 [Reviews, abstracts, films, books, etc.](#)

Computer Graphics staff


July 1975 **ACM SIGGRAPH Computer Graphics**, Volume 9 Issue 2

Full text available:  pdf(413.67 KB) Additional Information: [full citation](#)

16 [Multimodal error correction for speech user interfaces](#)

Bernhard Suhm, Brad Myers, Alex Waibel

March 2001 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 8 Issue 1

Full text available:  pdf(244.34 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Although commercial dictation systems and speech-enabled telephone voice user interfaces have become readily available, speech recognition errors remain a serious problem in the design and implementation of speech user interfaces. Previous work hypothesized that switching modality could speed up interactive correction of recognition errors. This article presents multimodal error correction methods that allow the user to correct recognition errors efficiently without keyboard input. Correcti ...

Keywords: dictation systems, interactive error correction, multimodal interfaces, pen

input, performance model, speech input, speech user interfaces

17 Suede: a Wizard of Oz prototyping tool for speech user interfaces

Scott R. Klemmer, Anoop K. Sinha, Jack Chen, James A. Landay, Nadeem Aboobaker, Annie Wang

November 2000 **Proceedings of the 13th annual ACM symposium on User interface software and technology**


Full text available:  [pdf\(592.26 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: Wizard of Oz, design, design tools, informal user interfaces, low-fidelity, prototyping, speech user interfaces

18 The integrality of speech in multimodal interfaces

Michael A. Grasso, David S. Ebert, Timothy W. Finin

December 1998 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 5 Issue 4

Full text available:  [pdf\(179.44 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


A framework of complementary behavior has been proposed which maintains that direct-manipulation and speech interfaces have reciprocal strengths and weaknesses. This suggests that user interface performance and acceptance may increase by adopting a multimodal approach that combines speech and direct manipulation. This effort examined the hypothesis that the speed, accuracy, and acceptance of multimodal speech and direct-manipulation interfaces will increase when the modalities match the per ...

Keywords: direct manipulation, input devices, integrality, medical informatics, multimodal, natural-language processing, pathology, perceptual structure, separability, speech recognition

19 VoiceNotes: a speech interface for a hand-held voice notetaker

Lisa J. Stifelman, Barry Arons, Chris Schmandt, Eric A. Hulteen

May 1993 **Proceedings of the SIGCHI conference on Human factors in computing systems**

Full text available:  [pdf\(926.95 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


VoiceNotes is an application for a voice-controlled hand-held computer that allows the creation, management, and retrieval of user-authored voice notes—small segments of digitized speech containing thoughts, ideas, reminders, or things to do. Iterative design and user testing helped to refine the initial user interface design. VoiceNotes explores the problem of capturing and retrieving spontaneous ideas, the use of speech as data, and the use of speech input and output ...

Keywords: hand-held computers, non-speech audio, speech as data, speech interfaces, speech recognition

20 Universal speech interfaces

Ronald Rosenfeld, Dan Olsen, Alex Rudnick

October 2001 **interactions**, Volume 8 Issue 6

Full text available:  [pdf\(494.59 KB\)](#)  [html\(43.13 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

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